

DEVICE FOR ATTACHING AN ELASTIC MEMBER TO EXERCISE APPARATUS

Background of the Invention

Field of the Invention

This invention generally relates to resistance based exercise equipment and more particularly to a spring anchor for a spring biased resistance exercise devices such as a Pilates combo chair.

Description of Related Art

Today, many types of exercise equipment are available and used for fitness and/or medical reasons to burn off undesired calories, to improve cardiovascular ability, to tone or strengthen muscles, or to improve flexibility, balance, posture, etc. No matter what the desired end goal of a user of exercise equipment may be, almost all types of exercise equipment aid the user to achieve his or her desired goal by creating some form of adequate and effective resistance against repeated bodily movements of the user.

A hook is often used to connect each of the two ends of the spring (or generally a force resisting mechanism) to a fixed location on the exercise equipment. However, a hook may easily become unattached from the exercise equipment if the spring to which the hook is connected becomes relaxed. Thus, there is a need for a device that securely connects a force resisting mechanism to an appropriate location of exercise equipment and that allows the force resisting mechanism to remain securely connected in place as the tension and stress of the force resisting mechanism is varied or modulated.

A Pilates Wunda or Combo chair is one such exercise device that is basically a box structure that has one open side out of which one or two spring biased pivot arms protrude. The box structure is designed to rest on a horizontal surface such as a floor. Each of the pivot arms has one end fastened to an inside wall of the box. The free end of the pivot arm has a foot step/support pad mounted thereon. A user typically stands on the floor and steps or presses downward on the step pad at the free end of the pivot arm with his or her foot or hand to rotate the arm downward against tension provided by one or more coil springs attached between an

anchor point on the arm and an anchor point inside the box in order to perform various exercise movements.

One end of each coil spring is attached to one of the pivot arms typically via a hook. The other end of each coil spring typically has a hook that must be inserted into the eye of an eyebolt fastened to the inside or the inner sidewall of the combo chair structure. The user must physically bend down, look under the top of the chair to align and engage the hook into the eyebolt. This action is awkward and inconvenient for the user as it is often difficult to attach the spring without visually watching connection as it is being made.

Summary of the Invention

Against this backdrop the present invention has been designed. A preferred embodiment of the present invention is a spring anchor adapted to be fastened to a surface of an exercise apparatus such as a Pilates combo chair. In the combo chair application, the anchor in accordance with the present invention may be mounted on the pivot arm and also mounted to the inner sidewall of the box frame structure.

The anchor basically is an hourglass shaped solid body adapted to receive one end of a coil spring therearound. The solid body has a central axial bore therethrough, a maximum outer diameter, and a waist having a diameter less than the outer diameter. A flexible disc is fastened to a top portion of the body. This disc has an outer diameter greater than the outer diameter of the solid body so that the outer edge of the disc extends beyond the solid body. A threaded cap member passes through the flexible disc and through the solid body fastening the flexible disc between the top of the solid body and a cap portion of the cap member. The threaded cap member then threads into the surface of the exercise device. The spring anchor outer diameter is sized to fit within an eye at the one end of the coil spring and the flexible disc is sized larger than the eye, so that the flexible disc elastically deflects and deforms to permit the eye to pass over the disc and onto the spring anchor.

After a spring is fastened to the anchor, the flexible disc prevents inadvertent slippage of the eye of the spring off of the anchor. The spring can easily be removed from the anchor by releasing the tension on the spring and forcing the eye over the flexible disc and off the anchor body. The flexible disc acts as a retainer or guard on the anchor to prevent inadvertent dislodging of the spring from the anchor. These and other features, advantages and objects of the

invention will become more apparent from a reading of the following detailed description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

FIG. 1 is a perspective view of an exercise apparatus that incorporates an embodiment of the present invention.

FIG. 2 is a side view of an anchor in accordance with an embodiment of the present invention separate from the exercise apparatus shown in **FIG. 1**.

Detailed Description of the Invention

One type of exercise apparatus, which utilizes an embodiment of the present invention described hereinafter, is shown in **FIG. 1**. The Pilates combo chair **100** may have single or split steps **102**. The split steps **102** may easily be converted into a single step by inserting a dowel (not shown), horizontally through a bore **108** through each of the two aligned split steps **102**. The dowel connects the split steps together forming a single step. As shown in **FIG. 1**, each step is at the free end of a pivot arm **104**. The other end of the pivot arm **104** is connected to the base of the box shaped frame structure **106** the combo chair **100** by a self-lubricating bearing for smooth operation and rotation of the arm **104**. The step **102** is padded and covered with a rubberized or other type of non-slip material that minimize accidental foot slippage by increasing the surface friction between the step and a user's foot that rests on the step **102**. One or more springs **110** each have one end **112** connected to the pivot arm **104** via an anchor **120**. The other end **114** of the spring **110** is fastened to a sidewall of the frame structure **106** via another anchor **120** in accordance with the present invention.

A user performs various exercises by placing one or two feet on the footrests and undergoing a series of stepping movements. The springs **110** provide a level of resistance that may be varied by changing the number of springs and/or the spring attachment location to one of the anchors **120** to which the spring or springs are attached. For example, the combo chair **100** shown in **FIG. 1** has five spring attachment anchors in accordance with the present invention for each step **102**. There are three anchors on the sidewall of the frame **106** of the combo chair **100** and two on the step pivot arm **104** near the step **102**.

The anchor **120** is shown in a separate side view in FIG. 2. Also shown in FIG. 2 is a cross section of one of the closed hook ends of a spring that forms a ring or eye **132** that is positioned just over the anchor **120** to illustrate the relative dimensions of the ring **132** and the anchor **120**. The anchor **120** has an hourglass-shaped solid body **122** preferably made of a metal such as aluminum or steel that has a central axial through bore **124**. The upper portion **126** of the body **122** has an outer diameter greater than a mid waist portion **128**. Thus the waist **128** has a diameter less than the maximum outer diameter of the upper portion **126**. The body **122** is shaped and sized to receive one closed end **132** of a coil spring **110** therearound.

A flexible disc **130** is positioned on the top of the upper portion of the body. This disc **130** has an outer diameter greater than the maximum outer diameter of the upper portion **126** of the solid body **122**. A washer **134** is positioned on top of the flexible disc **130** and a cap bolt **136** passes through the washer **134**, the disc **130**, and through the axial bore **124**. The cap bolt **136** is then fastened to a surface such as the box frame **106** of the combo chair **100** or fastened to the pivot arm **104** as is shown in FIG. 1.

The spring anchor outer diameter is sized to fit within the ring **132** at the end of the coil spring **110**. The flexible disc **130** is sized larger than the eye of the ring so that the flexible disc **130** must elastically deform or deflect to permit the ring **132** to pass over the disc **130** and onto the spring anchor body **122**. The flexible disc **130** prevents inadvertent slippage of the ring **132** of the spring **110** off of the anchor **120**. The flexible disc **130** is an annular disc made of an elastomeric material and is preferably made of a reinforced neoprene that is flexible yet has sufficient stiffness to preclude inadvertent dislocation of the ring **132** from the anchor **120**. One such material is a neoprene laminate that has one or more reinforcing fabric layers embedded in the neoprene substrate.

The cap member that holds the washer **134**, the flexible disc **130**, and the anchor body **122** together is preferably a threaded bolt **136** that has a cap portion and a threaded portion that passes through the solid body **122** and through the central aperture in the flexible disc **130**. This cap member may be a screw or a bolt and the cap portion preferably is a rounded head to hold the washer in place on the flexible disc **130** and together with the body **122** against the supporting surface. The washer **134** may be omitted from the anchor **120** if the flexible disc **130** has sufficient rigidity of its own accord to retain the ring **132** on the anchor **120**. The washer **134** may also be omitted if the head of the bolt **136** is wide or broad enough in diameter to provide

the support of the flexible disc 130 required. Thus, an embodiment of the present invention described hereinabove provides safety, convenience, and ease of use to users of exercise equipment.

It will be clear that the present invention is well adapted to attain the ends and advantages mentioned as well as those inherent therein. While a presently preferred embodiment has been described for purposes of this disclosure, numerous changes may be made which will readily suggest themselves to those skilled in the art and which are encompassed in the spirit of the invention as set forth in the following claims.